



# Gamification for farmer engagement and learning



March 2022

Claire Hardy<sup>1</sup> and Malcolm Collie<sup>2</sup>

<sup>1</sup> [Claire.Hardy@hutton.ac.uk](mailto:Claire.Hardy@hutton.ac.uk)

<sup>2</sup> [Malcolm.Collie@hutton.ac.uk](mailto:Malcolm.Collie@hutton.ac.uk)

## Introduction

Stakeholder engagement endeavours to deliver a clear take home message that is focused and on target. Too often the format of engagement: written text in the form of reports, are not able to keep the attention of the audience and the message is lost. We seek to develop a unique environment that allows interaction with resources whilst entertaining and engaging the target audience. To achieve this we use gaming technology and gaming concepts called gamification: this is the process of applying game mechanics, strategies and technology to a non-gaming environment to increase active engagement, motivate the participants and entertain. The DigiTools suite are under development at the James Hutton institute. The fundamental approach is to incorporate gaming technology to allow people to visualise reality. Serious games have been shown to aid natural learning by interaction with the information.

## Structure

The DigiFarm serious game, being developed, relies on a simulated environment depicting a generalised farm (Fig 1). The simulated environment, developed by a software engineer, uses stylised components designed in Unreal Engine. The participants are able to roam around the 'farm' choosing their preferred route and interacting with the components. Incorporated in the environment are spheres holding 360-degree images, both stills and video footage.

Fig 1: Simulated environment depicting grazing sheep



The spheres (Fig 2) contain content relevant to the area in the farm where they are situated e.g. if situated at the edge of a field the content could relate to: biodiversity, field margins, pollinators. The 360-degree footage allows the participant to enter a real scene and interact with the content. Resources can be added to these spheres to inform the viewer: PDFs, images; podcasts; videos; URL links. In addition surveys and interactive questions can be inserted. The game will be accessed by a login process that will collect basic contextual data. This data will allow the user to retrieve their scores encouraging competition and the data can be extracted for analysis.

Devices that can be used to view the game include: desktop; laptop; tablet; or smart phone. If the game is viewed on a smartphone using a headset, a fully immersive experience can be obtained. Eye tracking hardware can also be linked to analyse the viewer experience.



Fig 2: Spheres within the simulated environment

## Co-development

To ensure the serious game is developed, to stimulate engagement, stakeholder's relevant to the agricultural community have been invited to engage with the process. Several virtual meetings have allowed the game to be demonstrated during development. Discussions have been useful to identify what components to incorporate and where the focus should be targeted. They have also been involved with selecting relevant resources to be incorporated and the most appropriate formats. Feedback surveys will be added to a social hub of the game to gather ongoing feedback. This will be analysed to allow the game to be developed further, enhancing the participant experience.

## Future work

The DigiTools format will be continued to be developed. We currently have the DigiForest (Agroforestry stakeholder engagement platform), The DigiCroft (training platform being developed with H2020 DESIRA) and the DigiFarm (serious game).

The DigiFarm will be used to create a game exploring on-farm biodiversity in collaboration with the H2020 project Framework. Additional functionality will add the social hub for live chat and forum discussions. The game will be developed for four countries the: Czech Republic; Netherlands; Austria and UK. The game will be used with the farmer clusters to look at biodiversity knowledge at the start of the project and after project activities, to assess impact.

In the new RESAS programme the game will be used to test interventions to identify effective interventions and incentives for influencing farmer behaviour. The game will be adapted to allow farmers select their choices, data gathered will be analysed to assess how behavioural factors affect the perception of costs and benefits and influence the uptake of the measures examined. Eye tracking hardware will be used to assess the participant experience to develop future game enhancements.

---

## Further information

The James Hutton Institute  
Craigiebuckler, Aberdeen  
Scotland  
UK

## Contact

Claire Hardy [DigiTools@hutton.ac.uk](mailto:DigiTools@hutton.ac.uk)



Scottish Government  
Riaghaltas na h-Alba  
gov.scot



This research is funded by Scottish Government's Rural and Environmental Science and Analytical Services Division (RESAS) under Theme 1: Natural Assets (2016–2021). The views expressed are those of the authors and do not necessarily reflect those of the Scottish Government.

